

Amendment, and Response

Applicant: Ray A. Walker

Serial No.: 10/044,476

Filed: January 10, 2002

Docket No.: 10019374-1

Title: METHOD AND APPARATUS FOR TRANSFERRING INFORMATION BETWEEN A PRINTER PORTION AND A REPLACEABLE PRINTING COMPONENT

The use of the linking device 34 that is immersed in ink within the replaceable ink reservoir 32 provides a relatively low cost method for determining status such as an out of ink condition. Disposing the linking device 34 in the ink reservoir 24 allows for ink level and ink parameters to be measured using a relatively low cost manufacturing techniques.

IN THE CLAIMS

Please amend claims 1, 3, 5, 7, 12, 16, and 23 as follows:

Amend

1. (Amended) An ink level sensing system for determining ink level in an ink reservoir and providing this ink level information to a printing system, the ink level sensing system comprising:

an ink reservoir having a radio frequency interface disposed therein; and
a printing device configured for receiving the ink reservoir, the printing device including a radio frequency interface for receiving ink level information that is coupled through the ink reservoir by the radio frequency interface within the ink reservoir.

2. The ink level sensing system of claim 1 further including a sensor electrically connected to the radio frequency interface disposed within the ink reservoir, the sensor providing a sensor output signal indicative of ink level within the ink reservoir to the radio frequency interface.

Amend

3. (Amended) The ink level sensing system of claim 1 wherein the ink reservoir includes a sidewall and wherein the radio frequency interface includes an antenna for coupling a radio frequency signal through the sidewall to the printing system.

4. The ink level sensing system of claim 1 wherein the radio frequency interface within the ink reservoir is enclosed in an encapsulant material and wherein the encapsulant material is at least partially surrounded by ink within the ink reservoir.

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Title: METHOD AND APPARATUS FOR TRANSFERRING INFORMATION BETWEEN A PRINTER PORTION AND A REPLACEABLE PRINTING COMPONENT

5. (Amended) The ink level sensing system of claim 2 wherein the sensor is a pair of electrodes disposed within the ink reservoir to measure electrical continuity through ink within the ink reservoir.

6. The ink level sensing system of claim 2 wherein the sensor is a pair of electrodes disposed within the ink reservoir to measure electrical capacitance between the pair of electrodes.

7. (Amended) A replaceable printing component for use in a printing system, the replaceable printing component for containing a supply of print material for use by the printing system to form images on media, the replaceable printing component comprising:

a reservoir for containing printing material; and

a linking device disposed entirely within the reservoir for emitting a signal indicative of printing material within the reservoir wherein the reservoir is formed of a material so that the emitted signal passes through the reservoir for providing information to the printing system.

8. The replaceable printing component of claim 7 wherein the linking device is a radio frequency linking device for providing a radio frequency signal.

9. The replaceable printing component of claim 7 wherein the replaceable printing component is a replaceable ink reservoir and wherein the linking device includes a sensor that provides an output signal indicative of ink within the ink reservoir and wherein the output signal is coupled to the printing system by the linking device.

10. The replaceable printing component of claim 7 wherein the replaceable printing component is a replaceable ink reservoir and wherein the linking device includes a sensor having a pair of electrodes disposed within the ink reservoir to measure electrical continuity through ink within the ink reservoir.

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11. The ink level sensing system of claim 7 wherein the replaceable printing component is a replaceable ink reservoir and wherein the linking device includes a sensor having a pair of electrodes that are disposed within the ink reservoir to measure capacitance between the pair of electrodes.

as filed

12. (Amended) The ink level sensing system of claim 7 wherein the reservoir does not contain electrical conductors that extend from within the reservoir to a location outside the reservoir.

13. A printing system having a printer portion and at least one replaceable reservoir, the printer portion and the at least one replaceable reservoir exchanging information therebetween, the printing system comprising:

a first wireless link associated with the replaceable reservoir, the first wireless link disposed entirely within the replaceable reservoir; and

a second wireless link associated with the printer portion, the second wireless link receiving replaceable reservoir information from the first wireless link by transmission of information in a wireless manner.

14. The printing system of claim 13 wherein the first wireless link is a radio frequency transmitter for transmitting a radio frequency signal and the second wireless link is a radio frequency receiver for receiving the radio frequency signal and determining the replaceable reservoir information based thereon.

15. The printing system of claim 13 wherein the replaceable reservoir is a replaceable ink reservoir and wherein the replaceable reservoir information is ink level information for the replaceable ink reservoir.

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A16 cont.*

16. (Amended) The printing system of claim 13 wherein the first wireless link includes a pair of electrodes disposed in the replaceable reservoir to measure electrical continuity of ink within the replaceable reservoir.

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17. The printing system of claim 13 wherein the first wireless link includes a pair of electrodes disposed in the replaceable reservoir to measure capacitance between the pair of electrodes.

18. The printing system of claim 13 where the printer portion is an ink jet printer and wherein the replaceable reservoir contains ink.

19. A method for transferring status information from a replaceable printing component to a printer portion, the method comprising:

determining status information of the replaceable printing component using a sensor disposed within the replaceable printing component; and

transferring status information using a wireless link through a sidewall of the replaceable printing component to the printer portion.

20. The method of claim 19 wherein the replaceable printing component is an ink reservoir and the printer portion is an ink jet printer and wherein the status information is ink level information in the ink reservoir.

21. The method of claim 19 wherein the transferring status information is accomplished by providing a radio frequency signal that couples through a sidewall of the replaceable printing component.

22. A replaceable ink container for providing ink to an inkjet printing system, the replaceable ink container including:

a sensing system for sensing parameters of ink within an ink container wherein ink type within the replaceable ink container is determined by the inkjet printing system based on the sensed parameters.

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PORTION AND A REPLACEABLE PRINTING COMPONENT

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23. (Amended) The replaceable ink container of claim 22 wherein the sensing system includes a pair of electrodes disposed in the replaceable ink container for measuring electrical continuity of ink within the replaceable ink container.

24. The replaceable ink container of claim 22 wherein the sensing system includes a pair of electrodes for measuring capacitance between the pair of electrodes.

25. The replaceable ink container of claim 22 wherein the sensing system senses more than one parameter of ink within the ink container.